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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/758,795	01/16/2004	Bertram Gunzelmann	068758.0158	6493

31625 7590 07/26/2007

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EXAMINER	
FLORES, LEON	

ART UNIT	PAPER NUMBER
2611	

MAIL DATE	DELIVERY MODE
07/26/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/758,795	GUNZELMANN, BERTRAM	
	Examiner	Art Unit	
	Leon Flores	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 May 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) *2,7,12 and 16* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-6,8-11,13-15,17 and 18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 5/31/2007have been fully considered but they are not persuasive.

Response to Remarks

Rejections under 35 U.S.C. § 102

Applicant asserts that "even though, Alelyunas discloses compensation for phase errors, Alelyunas does not disclose the specific equations according to the amended independent Claims. Furthermore, Alelyunas discloses that the signals I" and Q" after multipliers 26 can be represented by equation (9). However, this representation merely describes the components of the signals I" and Q". It does not describe a compensation matrix. Alelyunas does, however, disclose a compensation matrix with equation (10). However, this equation uses a different matrix than proposed by the amended claims".

The examiner respectfully disagrees. In Alelyunas, equation 9 does describe the compensation matrix (rotational matrix, which is notoriously well known in the art) disclosed by applicant. The only difference between the two compensation matrices is that the applicant is dividing the phase error by 2. However, taking the contrary, the applicant does disclose in all of the independent claims that "or on the basis of an approximation of this equation". Therefore, in view of this limitation, the examiner was able to reject applicant's equation based on equation 9 in Alelyunas.

Rejections under 35 U.S.C. §103

Please see arguments above, since the same reasoning as presented with respect to claims 6 and 15 also applies for independent claims 1 and 11.

Specification

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of **50 to 150 words**. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. **Claims (6, 8-10, 15, 17) are rejected under 35 U.S.C. 102(b) as being anticipated by Alelyunas et al (hereinafter Alelyunas) (US Patent 5,705,949).**

3. Re claim 6, A method for compensating for a phase error in a reception system having I and Q signal processing paths, comprising the following steps: programming a phase error $\Delta\Phi$, previously ascertained by measurement, in a radio frequency reception

stage used in the reception system into the digital signal processing section of the reception system when the reception system is first fitted or when it is maintained (See figure :28 & col. 5, lines 25-45. Furthermore, Є represents a measure of the quadrature phase error and is implemented in a DSP 16.); and computing phase corrected I and Q signal components in a digital signal processing section of the I and Q signal processing paths of the reception system during reception mode by correcting I and Q signal components containing phase errors with the programmed constant phase error ΔΦ (See figures: 18A & 18B, & equation 9.), wherein the computation is performed on the basis of 7 [I (ΔΦ) Q (ΔΦ)] = [cos (ΔΦ / 2) - sin (ΔΦ / 2) - sin (ΔΦ / 2) cos (ΔΦ / 2)] [I Q] or on the basis of an approximation of this equation, where I and Q are the I and Q signal components containing phase errors, I(ΔΦ) and Q(ΔΦ) are the phase error compensated I and Q signal components, and ΔΦ is the phase error used for the correction. (See col. 5, lines 30-41, including equation 9.)

Claim 7 was cancelled.

Re claim 8, The method as claimed in claim 7, wherein the computation is performed on the basis of 8 [I (ΔΦ) Q (ΔΦ)] = [1 - ΔΦ / 2 - ΔΦ / 2 - ΔΦ / 2 1 - ΔΦ / 2] [I Q] (One skilled in the art would know that this matrix can be obtained by simply applying very well known trigonometry identities and arc (cosines & sines) to the previous matrix in claim 2.)

Re claim 9, The method as claimed in claim 6, comprising the following step: ascertaining a value for the phase error $\Delta\Phi$ used for the correction using a statistical method based on measurements of the phase errors in a multiplicity of radio frequency transmission stages and radio frequency reception stages. (See col. 5, lines 39-42 & col. 4, lines 29-30.)

Re claim 10, The method as claimed in claim 6, comprising the following step: ascertaining a value for the phase error $\Delta\Phi$ used for the correction by measuring the phase error in a particular radio frequency transmission stage or radio frequency reception stage. (See col. 5, lines 39-42 & col. 4, lines 29-30.)

Claim 15 is a system claim corresponding to method claim 6. Hence, the steps performed in method claim 6 would have necessitated the elements in system claim 15. Therefore, claim 15 has been analyzed and rejected w/r to claim 6.

Claim 16 was cancelled.

Claim 17 is a system claim corresponding to method claim 8. Hence, the steps performed in method claim 8 would have necessitated the elements in system claim 17. Therefore, claim 17 has been analyzed and rejected w/r to claim 8.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. **Claims (1, 3-5 & 11, 13) are rejected under 35 U.S.C. 103(a) as being unpatentable over Alelyunas et al (hereinafter Alelyunas) (US Patent 5,705,949).**

Re claim 1, Alelyunas discloses a method for compensating for a phase error in a transmission system having I and Q signal processing paths, comprising the following steps: programming a phase error $\Delta\Phi$., previously ascertained by measurement, in a radio frequency transmission stage used in the transmission system into the digital signal processing section of the transmission system when the transmission system is first fitted or when it is maintained (See figure :28 & col. 5, lines 25-45. Furthermore, ϵ represents a measure of the quadrature phase error and is implemented in a DSP 16.); and computing phase corrected I and Q signal components in a digital signal processing section of the I and Q signal processing paths during transmission mode by correcting I

and Q signal components with the programmed constant phase error ΔΦ(See figures :18A & 18B, & equation 9.), wherein the computation is performed on the basis of [I (ΔΦ) Q (ΔΦ)] = [cos (ΔΦ / 2) - sin (ΔΦ / 2) - sin (ΔΦ / 2) cos (ΔΦ / 2)] [I Q] or on the basis of an approximation of this equation, where I and Q are the I and Q signal components containing phase errors, I(ΔΦ) and Q(ΔΦ) are the phase error compensated I and Q signal components, and ΔΦ is the phase error used for the correction. (See col. 5, lines 30-41, including equation 9.)

But the reference of Alelyunas fails to specifically disclose that the phase compensation unit is located in a transmission system. However, it is notoriously very well known in the art that phase compensation takes place not only in receiver, but also in a transmission system.

Therefore, it would have been obvious to one of ordinary skill in the art to have incorporated a phase compensation unit for correcting phase errors into the system of Alelyunas, in the manner as claimed, for the benefit of obtaining a pre-distorted signal prior to broadcasting as shown in figure 6A, in reference **(US Patent 5,111,155)** by Keate et al.

Claim 2 was cancelled.

Re claim 3, Alelyunas further discloses that wherein the computation is performed on the basis of [I (ΔΦ) Q (ΔΦ)] = [1 - ΔΦ / 2 - ΔΦ / 2 - ΔΦ / 2 1 - ΔΦ / 2] [I Q] (One skilled in the art would know that this matrix can be obtained by simply

applying very well known trigonometry identities and arc (cosines & sines) to the previous matrix in claim 2.)

Re claim 4, Alelyunas further discloses ascertaining a value for the phase error $\Delta\Phi$ used for the correction using a statistical method based on measurements of the phase errors in a multiplicity of radio frequency transmission stages and radio frequency reception stages. (See col. 5, lines 39-42 & col. 4, lines 29-30.)

Re claim 5, Alelyunas further discloses ascertaining a value for the phase error $\Delta\Phi$ used for the correction by measuring the phase error in a particular radio frequency transmission stage or radio frequency reception stage. (See col. 5, lines 39-42 & col. 4, lines 29-30.)

Claim 11 is a system claim corresponding to method claim 1. Hence, the steps performed in method claim 1 would have necessitated the elements in system claim 11. Therefore, claim 11 has been analyzed and rejected w/r to claim 1.

Claim 12 was cancelled.

Claim 13 is a system claim corresponding to method claim 3. Hence, the steps performed in method claim 3 would have necessitated the elements in system claim 13. Therefore, claim 13 has been analyzed and rejected w/r to claim 3.

Claims (14 & 18) are rejected under 35 U.S.C. 103(a) as being unpatentable over Alelyunas et al (hereinafter Alelyunas) (US Patent 5,705,949), applied to claims 1 & 6, and further in view of Gurantz et al (hereinafter Gurantz) (US Patent 5,550,869).

Re claim 14, The reception and/or transmission system as claimed in claim 11, the reference of Alelyunas fails to specifically disclose that wherein the computation unit is designed to perform the computation on the basis of the CORDIC algorithm.

However, Gurantz does. (See Abstract) Gurantz discloses a derotator responsive to outputs of converters and a digital signal representing frequency and phase corrections for an input to the demodulator operates in accordance with a CORDIC function to derive I and Q channel digital signals that are compensated by the corrections.

Therefore, taking the combined teachings of Alelyunas & Gurantz as a whole. It would have been obvious to one of ordinary skill in the art to have incorporated this feature into the system of Alelyunas, in the manner as claimed and as taught by Gurantz, for the benefit of optimizing the demodulator by utilizing a CORDIC functions rather than the table look-up approach and reducing costs. (See col. 4, lines 14-18)

Claim 18 has been analyzed and rejected w/r to claim 14 above.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leon Flores whose telephone number is 571-270-1201. The examiner can normally be reached on Mon-Fri 7-5pm Alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Payne can be reached on 571-272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LF
July 11, 2007

DAVID C. PAYNE
SUPERVISORY PATENT EXAMINER